

What is claimed is:

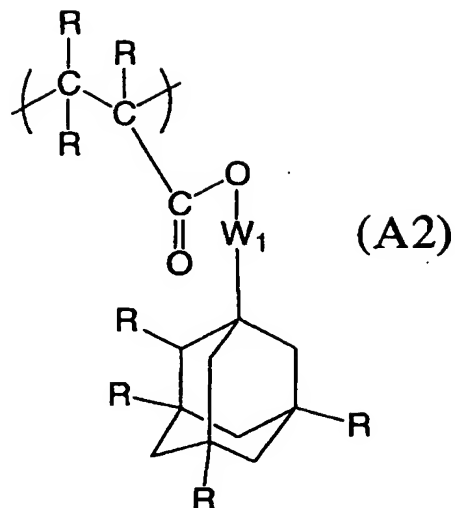
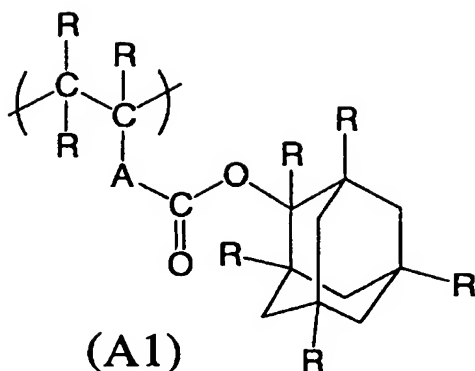
1. A positive resist composition comprising:

at least two resins, each comprising: at least one of a repeating unit derived from an acrylic acid derivative monomer and a repeating unit derived from a methacrylic acid derivative monomer; an alicyclic structure; and at least one group that increases a solubility of each of the at least two resins in alkaline developer by the action of an acid; and

a compound which generates an acid upon irradiation with actinic rays or radiation,

wherein a first resin of the at least two resins has a glass transition temperature different from that of a second resin of the at least two resins by at least 5°C.

2. The positive resist composition as claimed in claim 1, wherein at least one of the first and second resins comprises at least one kind of repeating units selected from ones represented by the formulae (A1) and (A2):



wherein

R represents a hydrogen atom, a hydroxyl group, a halogen atom, or an alkyl group having 1 to 4 carbon atoms, provided that the R's are the same or different;

A is a single bond or represents one group or a combination of two or more groups selected from the group consisting of alkylene, ether, thioether, carbonyl, ester, amide, sulfonamide, urethane, and urea groups; and

W₁ represents an alkylene group.

3. The positive resist composition as claimed in claim 1, wherein each of the first and second resins comprises both of a repeating unit derived from the acrylic acid derivative monomer and a repeating unit derived from the methacrylic acid derivative monomer and the difference between the molar proportion of the repeating unit derived from the acrylic acid

derivative monomer in the first resin and that in the second resin is from 20 to 95 mol%.

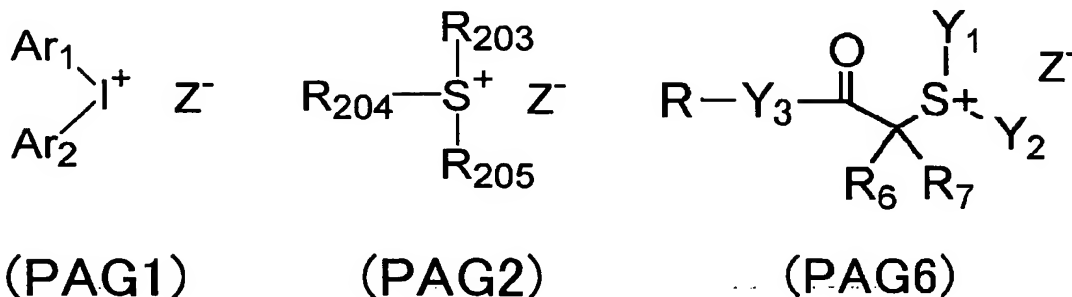
4. The positive resist composition as claimed in claim 1, wherein one of the first and second resins has a glass transition temperature lower than 140°C and the other one of the first and second resins has a glass transition temperature of from 140°C to lower than 180°C.

5. The positive resist composition as claimed in claim 1, wherein one of the first and second resins does not comprise a repeating unit derived from the methacrylic acid derivative monomer and the other one of the first and second resins comprises both of a repeating unit derived from the acrylic acid derivative monomer and a repeating unit derived from the methacrylic acid derivative monomer.

6. The positive resist composition as claimed in claim 1, wherein at least one of the first and second resins comprises at least one of a repeating unit derived from a dihydroxyadamantyl methacrylate monomer and a repeating unit derived from a dihydroxyadamantyl acrylate monomer.

7. The positive resist composition as claimed in claim 1, wherein the compound which generates an acid upon irradiation

with actinic rays or radiation is at least one member selected from the group consisting of compounds represented by formulae (PAG1), (PAG2), and (PAG6):



Ar^1 and Ar^2 each independently represents an aryl group;

R^{203} , R^{204} , and R^{205} each independently represents an alkyl group or an aryl group;

R represents a chain or cyclic alkyl group or an aromatic group;

Y_3 represents a single bond or a bivalent connecting group;

R_6 and R_7 each represents a hydrogen atom, a cyano, an alkyl group, or an aryl group, provided that R_6 and R_7 may be bonded to each other to form a ring;

Y_1 and Y_2 each represents an alkyl group, an aryl group, an aralkyl group, or an aromatic group containing one or more heteroatoms, provided that Y_1 and Y_2 may be bonded to each other to form a ring; and

Z^- in each formula represents a counter anion.

8. A method of pattern formation comprising:

forming a photoresist film on a semiconductor substrate with a positive resist composition as claimed in claim 1;

subjecting the photoresist film to pattern-wise exposure with at least one of: radiation having a wavelength of 200 nm or shorter; electron beams; X-rays; and ion beams;

heating the photoresist film;

developing the photoresist film to form a contact hole pattern having a hole size larger than a desired size; and

heating the semiconductor substrate to a temperature of from 120 to 200°C to cause the contact hole pattern to flow thermally and thereby form a contact hole pattern having the desired hole size.